

Signode Eastern Operations

Reduces Lead in Strapping Systems

Signode Eastern Operations held an aggressive campaign to eliminate lead in the production of its low-carbon steel strapping for packages. Product substitution resulted in a 17 percent reduction in lead and a \$54,000 annual savings in energy costs. The company worked cooperatively with EPA Region 3 and Maryland to achieve these pollution prevention goals.

About Signode Eastern Operations

Signode Eastern Operations is a manufacturer of low- and high-carbon steel and plastic strapping systems used in industrial packaging. Signode Eastern Operations is one of three plants located across the country. The others are in Bridgeview, Illinois, and Pittsburg, California. All three plants implemented the waste minimization efforts described below.

Signode's Accomplishments

Molten lead had been used to clean and oxidize steel strapping before it is painted. Lead baths removed deposits on the steel, and charcoal beds were used to wipe off the excess lead. This produced lead dross, impurities from the molten lead bath, and lead-containing charcoal waste.

In 2001, Signode Eastern Operations began using a chemical treatment instead of molten lead baths in the production of its low-carbon steel strapping, which eliminated 100,000 pounds of lead (300,000 at all three plants). Signode further reduced lead use by an additional 24,000 pounds (72,000 pounds at all three plants) of lead annually by eliminating lead dross and lead in the charcoal beds—a 17 percent reduction.

Signode's Waste Minimization Strategies

For years, the company had looked for ways to substitute lead use because of its hazards to its employees and the environment. By 2001, Signode's corporate office had eliminated

molten lead baths in all three Signode plants nationwide. Switching to a less expensive substitute was also a motivating factor. It was more environmentally friendly and economical to substitute lead with the new chemical treatment. The switch to the chemical process from molten lead baths took place one by one at each of Signode's three plants, over a six-year period. The initial development started with Signode's Corporate Engineering Group, which devised the new process. The initial implementation was in Signode's Bridgeview, Illinois, facility. After the new process was proven, the California facility received the process next. Finally, the implementation in Baltimore, Maryland, in 2001 completed all of Signode's U.S. facilities.

Project Snap Shot

Achievements:

- Eliminated 100,000 pounds of lead from its molten bath.
- Eliminated 24,000 pounds of lead per year from charcoal beds and dross (17 percent reduction).
- Saved \$54,000 annually in energy costs.
- Signode, an Illinois Tool Works Incorporated Company, converted three sister plants to further implement waste minimization.

Site Location:

Baltimore, Maryland

Manufacturer of strapping systems for industrial packaging

Technology Used

Overall, the process modifications and updates took about six weeks for each facility. Signode removed the charcoal beds, the old lead baths, and their surrounding structures and filled the depressions with concrete. A new structure was erected to provide adequate space and support for the chemical bath process. The chemical treatment system includes a large chemical bath along with a water rinse system.

Environmental Benefits

As a result of using the more environmentally friendly chemical process instead of molten lead baths and eliminating lead in charcoal beds, Signode no longer needs to ship lead-containing charcoal waste and lead dross produced by the lead process off-site for treatment, disposal, and/or recycling. In addition, Signode substantially reduced air emissions through the reduction of gas-fired burners from 11 to 1 and the elimination of an entire dust collection and air scrubbing system.

Economic Benefits

Start-up Costs: \$425,000

Return on Investment: The return on Signode's initial investments will take 4.7 years.

Energy Savings: Total energy savings is over \$54,000 annually—\$162,000 total savings at all three plants.

Challenges

The switch from a molten lead bath to the new chemical bath resulted in a non-uniform paint color on the steel strapping. Signode Eastern Operations faced and overcame its customers' perceived change of product quality. Signode found that it was very important to educate its customers that the straps' performance would not change and that the process was environmentally better. In addition to paint issues, other issues that needed to be addressed dealt primarily with the maintenance of the new process and its components, such as pump, bearing, and filtration needs.

Words of Wisdom

Companies need to demonstrate quality performance of a new or revised product to ensure customer acceptance and satisfaction.

On the Internet

www.epa.gov/wastemin

www.epa.gov/region3
